Common Core State Standards (CCSS) Mathematics Curriculum Materials Analysis Project

June 1, 2011

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Overview of the Common Core State Standards Mathematics Curriculum Analysis Project

In June 2010, the Council of Chief State School Officers and National Governor's Association released the Common Core State Standards for mathematics and literacy (CCSSO/NGA, 2010). By June 1, 2011, these standards had been adopted by 44 states, the District of Columbia and the US Virgin Islands. This work represents the first significant attempt in our nation's history to systematically align common K-12 mathematics standards across the states in our nation's history, building on previous efforts to create a national vision for mathematics education, including the National Council of Teachers of Mathematics' standards documents (1989, 2000, 2009, 2011). As such, the new *Common Core State Standards for Mathematics* (CCSSM) will stimulate significant and immediate revisions in state mathematics assessments and classroom curriculum materials.

Predictably, some publishers already claim that their existing curriculum materials and textbooks align with CCSSM (Gerertz, 2010); however, as stated by Michael Cohen, president of Achieve, Inc., "Almost no one thinks there are solid processes in place to examine the alignment of instructional materials to state standards." (p. 20) Over the coming years, as textbook companies revise their materials in accordance with the CCSSM, many K-12 teachers and administrators will find themselves in the position of selecting new mathematics curriculum materials. It is critical that educators have quality resources and tools to determine if the revised curriculum materials and textbooks truly align with the scope and intent of the new Standards.

To increase the likelihood that these Standards, including the both the Content Standards and Standards for Mathematical Practice, are fully implemented in mathematics classrooms across the country, school administrators and classroom teachers need immediate guidance to determine the extent to which the revised curriculum materials support implementation of the CCSSM. Given the significant changes represented in the CCSSM, it is unrealistic to expect that educators in school districts and schools have the time, resources, and background to devise independent review processes for these new standards and would require an inefficient use of local resources. To provide this guidance, the CCSS Mathematics Curriculum Analysis Project provides a set of tools to assist textbook selection committees, school administrators, and teachers in the selection of curriculum materials that support implementation of the new CCSSM.

With funding from the Brookhill Foundation and Texas Instruments and support from the Council of Chief State School Officers and National Council of Supervisors of Mathematics, a national team of educators with expertise in mathematics, mathematics education, and school administration developed a set of mathematics curriculum materials analysis tools. The team included the educators listed on the next page:

- William S. Bush (chair), Mathematics Educator, University of Louisville, Kentucky
- Diane J. Briars, Mathematics Education Consultant, Past President, National Council of Supervisors of Mathematics, Pennsylvania
- Jere Confrey, Mathematics Educator, North Carolina State University
- Kathleen Cramer, Mathematics Educator, University of Minnesota
- Carl Lee, Mathematician, University of Kentucky
- W. Gary Martin, Mathematics Educator, Auburn University, Alabama
- Michael Mays, Mathematician, West Virginia University
- Valerie Mills, Supervisor, Mathematics Education, Oakland Schools, Michigan
- Fabio Milner, Mathematician, Arizona State University
- Suzanne Mitchell, Mathematics Educator/Administrator, Executive Director of the Arkansas Science, Technology, Engineering and Mathematics (STEM) Coalition; President, National Council of Supervisors of Mathematics
- Thomas Post, Mathematics Educator, University of Minnesota
- Robert Ronau, Mathematics Educator, University of Louisville, Kentucky
- Donna Simpson Leak, Superintendent, Rich Township High School District 227, Olympia Fields, Illinois
- Marilyn Strutchens, Mathematics Educator, Auburn University; President, Association of Mathematics Teacher Educators, Alabama

Purpose of the Project

The purpose of the CCSS Mathematics Curriculum Analysis Project is to provide a set of tools that will assist K-12 textbook adoption committees, school administrators, and K-12 teachers in selecting mathematics curriculum materials that support implementation of the newly developed CCSSM. The tools are designed to provide educators with objective measures and information to guide their selection of mathematics curriculum materials based on evidence of the materials' alignment with the CCSSM and support for implementation of the CCSSM in classrooms. Ultimately, the choice of which curriculum materials to adopt must be made by committees or individuals charged with that task. The intention of the tools is to provide assistance in collecting useful information focused on salient issues related to the CCSSM, to ensure consistency across reviewers, and promote discussions about newly developed mathematics curriculum materials. Therefore, at the end of the analysis, the decision about which curriculum materials to select is one that must be made based on the collective evidence gathered with the tools and the committee's or reviewer's vision of the need for curriculum materials to support implementation of the CCSSM locally.

CCSSM is substantially different from past national and state standards. They contain standards about content with respect to both mathematical understanding and procedural skill (CCSSM, p. 4) and Mathematical Practices that focus attention on the varieties of mathematical expertise

and thinking that educators at all levels should seek to develop in their students. These Practices provide a detailed description of the way mathematics should be learned and used by students at all grade levels. The following Practices build on the Process Standards from NCTM (2000) and the strands of mathematical proficiency (National Research Council, 2001) that have been widely used in the field. These Practices describe what it means to really "do" mathematics:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Note that the Standards for Mathematical Practice are also standards and thus must be reflected in the assessments and curriculum materials that states and districts will adopt. Moreover, there are significant changes in the approach to the content, in the placement of content by grade level, and in curriculum emphasis. Thus, to ensure reliable results from the reviews of curriculum materials, the tools will be most effective if the teachers and administrators using them are well grounded in the content and in the specific language of the CCSSM. Professional development prior to the review, therefore, will be a critical component of the process. The CCSSM standards are available at http://www.corestandards.org/the-standards/mathematics.

Development of the Tools

The project team met as a group on three occasions (October 2010, January 2011, and May 2011) to develop the resources provided in this package. Three grade-band teams--K-5, 6-8, and 9-12--were formed to develop tools specific for each grade band. Three tools were developed to provide detailed information about the extent to which curriculum materials align with and support the implementation of CCSSM. Tool 1 focuses on mathematics content trajectories; Tool 2 focuses on Mathematical Practices; and Tool 3 focuses on important considerations complimentary to the standards like equity, assessment, and technology that can impact implementation of mathematics curricula. While Tool 1 is specific to a grade band, Tools 2 and 3 are general and apply to all grade bands. All three tools provide different lenses on which to base a comprehensive analysis and ultimately an informed decision.

The three tools went through various layers of development and review before being released more broadly. First, initial versions developed by the team were piloted with elementary, middle and high school mathematics teachers at three locations across the country. The tools were then revised based on these pilots. Second, the tools were sent to educators, including postsecondary mathematicians and mathematics educators and public school administrators, across the country for further

review. Feedback on the tools was also obtained during sessions at the Association of State Supervisors of Mathematics (ASSM) and NCSM Annual Meetings in April 2011. The tools were revised again based on feedback from these reviewers to obtain final versions. The project team then developed a User's Guide and a professional development experience to ensure potential reviewers used the tools as intended.

Curriculum analysis tools that describe alignment among standards and curriculum materials must consider how well both the Mathematics Content Standards and the Standards for Mathematical Practice are embedded in textbooks and curriculum materials. Tool 1 and Tool 2 were designed to analyze the "Core Curriculum" primary source materials, which generally meant the teacher's edition and the student edition. Clearly these primary source materials should consistently align with the Core Content and Mathematical Practices. Tool 3 offers reviewers the opportunity to analyze other materials such as computer software or teaching guides that can be incorporated as integral "must use" components of the curriculum materials.

Tool 1 provides information about the degree to which specific trajectories of mathematics topics are incorporated appropriately across grade-band curriculum materials. To make this analysis manageable and to provide an in-depth review, developers selected key mathematics domains as defined in CCSSM for each grade band. The four criteria for choosing these domains for review were: (1) they represented critical grade level mathematics content as defined by CCSSM; (2) they clearly reflected the standards at

each grade band; (3) they formed content trajectories within and across content areas; and (4) they represented a shift from current curricula. Attempting to look at all mathematics standards within a grade band is overly time consuming and not realistic given the number of different curriculum materials currently available to districts and schools. By focusing more deeply on a limited number of standards in key domains, reviewers will be able to conduct in depth reviews with greater reliability in a reasonable time frame.

Tool 1 focuses on key sequences of mathematics content standards across the four grade bands: K-2, 3-5, 6-8, and 9-12 in the CCSSM. These sequences span within and across grade levels in Tool 1. This organization of the standards in Tool 1 is designed to help reviewers determine the extent to which the curriculum materials develop mathematics content across grade levels, as well as within grade levels, according to the Standards. Since CCSSM does not specify course-level standards for high school, Tool 1 for high school content contains a range of domains that would show growth across grades, depending on what curriculum pathway is being considered for high school. Also, because high school mathematics curricula may be organized in two very distinct pathways, that is, traditional course sequence (Algebra I, Geometry, and Algebra II) as well as an integrated course sequence (Mathematics 1, Mathematics 2, Mathematics 3), reviewers should consider how they will assure coherence across courses in their high school curriculum.

The Content Domains (K-8) and Conceptual Categories (9-12) that the development team selected for Tool 1 at

each grade band are listed below. As mentioned above, Tool 1 does not exhaust the standards within each grade or category, but focuses on important domains or standards with within and across grades to provide a representative analysis within a reasonable time.

Domains			Clusters
K-2	3-5	6-8	9-12
• Number/Operations in Base 10 • Operations and Algebraic Thinking • Geometry	• Number/Operations in Base 10 • Operations and Algebraic Thinking • Geometry • Number and Operations-Fractions	• Ratios and Proportional Relationships • Expressions and Equations • Geometry • Statistics and Probability	• Interpreting Functions • Reasoning with Equations & Inequalities • Similarity, Right Triangles and Trigonometry • Geometric Measurement and Dimension • Interpreting Categorical and Quantitative Data

Tool 2 focuses on the extent to which the Standards for Mathematical Practice are embedded and integrated in the curriculum materials. Since the Mathematical Practices describe the essence of "doing mathematics," mathematics curriculum materials that align with the CCSSM must also provide teachers support in incorporating these Mathematical Practices into their lessons, thereby providing students ample opportunities to engage in the Practices.

Tool 3 focuses on the extent to which mathematics curriculum materials address overarching considerations related to equity, assessment, and technology. This tool guides reviewers to find evidence of teacher support with regard to establishing equitable teaching practices, integrating formative assessment into teaching, and using technology to support the learning and teaching of mathematics.

The three tools developed by the team provide school administrators, teachers, and others involved in selecting mathematics curriculum materials with information to carefully analyze the materials based on important criteria and provide evidence on which to base curriculum materials adoption decisions.

The sections that follow include: a User's Guide to assist reviewers in using the tools; grade-level versions of Tool 1, along with Tool 2 and Tool 3; and a Professional Development Guide with PowerPoint slides that can be used to prepare reviewers for using the tools reliably.

References

Common Core State Standards for Mathematics (2010). Washington, D.C.: Council of Chief State School Officers and National Governors Association.

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National Council of Teachers of Mathematics (1989). *Curriculum and Evaluation Standards for School Mathematics.* Reston, VA: The Council.

National Council of Teachers of Mathematics (2000). *Principles and Standards for School Mathematics.* Reston, VA: The Council.

National Council of Teachers of Mathematics (2009). *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics: A Quest for Coherence*. Reston, VA: The Council.

National Council of Teachers of Mathematics (2011). *Focus in High School Mathematics: Fostering Reasoning and Sense Making for All Students.* Reston, VA: The Council.

User's Guide
CCSS Mathematics Curriculum
Materials Analysis Project

June 1, 2011

The **User's Guide** offers specific suggestions about how to use the three curriculum analysis tools to analyze mathematics curriculum materials developed for grades K-12 with respect to the Common Core State Standards in Mathematics (CCSSM). Our experiences with curriculum analysis indicate that providing reviewers the tools and asking them to review curriculum materials is unlikely to lead to a successful analysis and selection process. Preparing the reviewers to use the tools reliably involves the following:

1. Providing professional development so that reviewers can familiarize themselves with the CCSSM and the tools;
2. Organizing teams for the work in order to analyze grade level trajectories within and across grades;
3. Using the tools in order from Tool 1 to Tool 2 to Tool 3 because Tool 2 and Tool 3 use information collected during the completion of Tool 1;
4. Providing adequate time for reviewers to conduct a thorough and in-depth reviews; and
5. Gathering teams together at the end to discuss transitions among grade levels and to use their combined evidence to make and justify recommendations regarding selection of materials.

Directions and suggestions for using each of the three tools are provided for reviewers in the User's Guide. The tools are designed to analyze the primary source materials that describe the learning experiences in which the student will be engaged, which generally means the teacher's edition and the student edition materials. All core curriculum materials should be used with all three tools. Other products such as computer software or teaching guides, provided that they are an integral "must use" or "will use" component of the curriculum, can be useful in responding to questions in Tool 3. The final decision should be based on evidence collected from all three tools and reflect the priorities of the school and/or district. **Throughout the process, reviewers should make independent decisions and not rely upon publisher-produced alignment guides.**

Using Tool 1

Tool 1 allows reviewers to analyze mathematics curriculum materials by identifying key content domains at each grade level K-8 and content clusters for high school. For grades K-8, Tool 1 also describes how the content standards can connect within and across grade levels. Tool 1 for grades K-8 was designed differently than Tool 1 for high school. The high school CCSSM addresses conceptual categories (p. 57) rather than grade bands. Furthermore, the high school content standards contain mathematics topics (denoted by +) that students should learn in order to take advanced mathematics courses such as calculus, advanced statistics or discrete mathematics (STEM standards). Reviewers should be aware of the two different content expectations of these two populations (i.e. college and career, advanced mathematics) as they review the curriculum materials.

In Tool 1, reviewers are required first to complete information about themselves and the curriculum materials under review. Below this information section are two sets of rubrics, one focused on the extent to which key mathematics content from the CCSSM is covered in the curriculum materials and one focused on the extent to which the curriculum materials include a balance of understanding and procedural skills. Overall Tool 1 includes four separate sections: (1) personal information about reviewers; (2) information gathered about the mathematics content in the curriculum materials; (3) Notes/Examples noted during the review of the curriculum materials; and (4) responses to 10 specific summary questions about the curriculum materials. The CCSSM specifies that "mathematical understanding and procedural skill are equally important and both are assessable using mathematical tasks of sufficient richness." (p. 4). To help reviewers capture this richness in the curriculum materials, two lenses are used: coverage and balance. **Coverage** refers to the degree to which the curriculum materials attend to the content of a particular standard. The Content Coverage Rubric reports the extent to which reviewers found the designated mathematics content areas listed in Tool 1. Reviewers must decide if (1) the mathematics content area was found, (2) major, some, or a few gaps were found, or (3) the mathematics content area was covered fully. A key consideration is how easily content gaps could be filled by the district, school, or teacher. For example, it might be relatively easy to provide practice on a particular skill that might be under-emphasized. Providing lessons to address development of a concept that is not addressed may be much more difficult.

Balance addresses the degree to which the mathematics content is developed with a balance between mathematical understanding and procedural skill in ways that are consistent with the standard. The rubric is designed to gather specific evidence regarding how the curriculum materials capture understanding and procedural skills as intended in the CCSSM.

Content Coverage Rubric (Cont):	**Balance of Mathematical Understanding and Procedural Skills Rubric (Bal)**:
Not Found (N) - The mathematics content was not found.	Not Found (N) - The content was not found.
Low (L) - Major gaps in the mathematics content were found.	Low (L) - The content was not developed or developed superficially.
Marginal (M) - Gaps in the mathematics content, as described in the Standards, were found and these gaps may not be easily filled.	Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) - Few gaps in the mathematics content, as described in the Standards, were found and these gaps may be easily filled.	Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The mathematics content was fully formed as described in the Standards.	High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

The Coverage and Balance rubrics use non-numeric scales, (i.e. Not Found, Low, Marginal, Acceptable, and High) to better capture the qualitative nature of this part of the review. We chose not to use a numerical scale for the rubrics because the categories are more appropriately used as guidance for discussions in order to make reasoned decisions about the curriculum materials rather than to compute an "average" numerical result.

Reviewers are required first to locate evidence of the Standards in the curriculum materials noting the location by page numbers in the first column labeled Chap Pages (chapter pages) beside the Standards. Reviewers are then asked to record their judgments regarding the Content Coverage and Balance Rubrics. **For this analysis, we suggest that the reviewers focus on only the teacher and student books, not any supporting materials.** Throughout the review process, reviewers should make notes of evidence that supports their judgment and write down key examples of what they found during the content analysis so that this information might be shared in subsequent group discussions about the curriculum materials.

At the end of Tool 1, reviewers are asked to respond to a set of questions under the headings *Overall Impressions*, *Content Alignment*, and *Balance between Mathematics Understanding and Procedural Skills*. These questions are designed to provide guidance for within and across grade-band discussions to determine the degree to which the key trajectories and content in the curriculum materials were developed in line with the CCSSM. Recording the final outcomes from these discussions will be useful for subsequent discussions and recommendations.

Using Tool 2

Tool 2 is used to determine the extent to which the curriculum materials were designed to provide students opportunities to engage in the Standards for Mathematical Practice. The CCSSM specify that "the Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important 'processes and proficiencies' with longstanding importance in mathematics education." (p. 6). This tool allows reviewers to determine how well the Mathematical Practices connect to student and teacher activities in the curriculum materials.

To begin the search for Mathematical Practices in curriculum materials, reviewers are pointed to the shaded cells in Tool 1. These content standards were chosen as a basis for reviewing the Mathematical Practices because
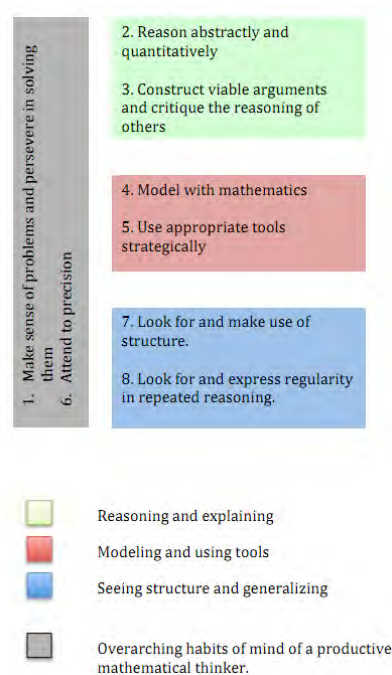

Figure 1

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developers felt that they had the greatest potential to incorporate the Mathematical Practices in the curriculum materials.

Using the content standards in those cells as a basis, reviewers can use their notes from Tool 1 to locate those content areas in the curriculum materials and analyze specific student tasks, assignments, or projects in the materials to determine, and then to assess, the extent to which the materials reflect the eight Mathematical Practices. Reviewers should record these results in Tool 2. Keep in mind that the identified content standards are only suggestions, not mandates, for where the practices might be addressed. To ensure that reviewers do not miss important aspects of curriculum materials designed to support the Mathematical Practices, reviewers should read the overview in Practices to ascertain the ways in which the materials addresses the Mathematical Practices. Reviewers can then use this information in using Tool 2.

The evidence and notes about the location and nature of the Practices should be recorded in the boxes under each of the eight Practices to facilitate discussions among reviewers later. If no evidence can be found to support a particular Mathematical Practice, a note should be made of this as well. A copy of the Standards for Mathematical Practice, presented as a bulleted list of the ways to engage in doing mathematics for each standard, accompanies Tool 2 to assist in the review. CCSSM places great emphasis on Standards for Mathematical Practice, so reviewers should become very familiar with these Practices and what they mean in order to effectively use this tool. The Mathematical Practices in Tool 2 have been organized in one possible configuration (Figure 1); however, the Practices are not necessarily discrete and other structures may be possible. One example or task may fit under multiple Mathematical Practices and should be recorded in each.

At the end of Tool 2, reviewers are asked to respond to a set of questions to determine the degree to which the mathematics content reviewed in the curriculum materials support teachers as they engage students in the Mathematical Practices. These questions are designed to provide guidance for within and across grade-band discussions. Recording the final outcomes from these discussions would likely be useful for subsequent discussions and recommendations.

Using Tool 3

Tool 3 is designed to address three overarching considerations that will impact the materials' effectiveness in supporting the CCSSM. It should be used after reviewing mathematics curriculum materials using Tool 1 (Content Analysis) and Tool 2 (Mathematics Practices Analysis). Based on what reviewers have noted in reviewing the materials, as well as in additional software or materials that have been identified by the committee as an integral "must use" or "will use" component of the curriculum, reviewers should answer the questions reflecting how well the curriculum materials support teachers with regard to the three important overarching issues of **Equity/Diversity/Access, Formative Assessment,** and **Technology** that support teaching the Mathematics Core Content and Mathematical Practices. With regard to **Equity/Diversity/Access**, the National Council of Teachers of Mathematics (NCTM,1991)

asked teachers to: (1) build on how students' linguistic, ethnic, racial, gender, and socioeconomic backgrounds influence their learning; (2) help students become aware of the role of mathematics in society and culture; (3) expose students to the contributions of various cultures to the advancement of mathematics; (4) show students how mathematics relates to other subjects; and (5) provide students with opportunities to apply mathematics to authentic contexts. CCSSM also notes that, "The Standards should be read as allowing for the widest possible range of students to participate fully from the outset, along with appropriate accommodations to ensure maximum participation of students with special education needs." **Formative Assessment** is an instructional process that, if implemented appropriately, can improve student learning. Curriculum materials can provide a variety of levels of support for formative assessment, including extra homework exercises, classroom tests, and ongoing tasks including innovative projects and other student products. Finally, the increasing availability of **Technology** offers opportunities to use technology mindfully in ways that assist teachers in teaching mathematics and enable students to explore and deepen their understanding of mathematical concepts and procedures, as well as improving problem-solving and reasoning skills.

Tool 3 requires reviewers to focus their analysis on answering individual questions related to the extent that the curriculum materials reflect equitable practices, embed high quality and high cognitive formative assessments, and encourage the use of technology in rich and appropriate ways. Reviewers might wish to revisit the curriculum materials as they address the questions in Tool 3. After answering the questions using the rubric, reviewers should write comments regarding their rating in spaces provided on the left hand side of the Tool. The rubric is listed below:

Rubric for answering questions about **Overarching Considerations**:

Not Found (NF)	The curriculum materials do not support this element.
Low (L)	The curriculum materials contain limited support for this element, but the support is not embedded or consistently present within and across grades.
Medium (M)	The curriculum materials contain support for this element, but it is not always embedded or consistently present within and across grades.
High (H)	The curriculum materials contain embedded support for this element so that it is consistently present within and across grades.

The rubric describes the extent to which the materials provide teachers support in these three critical overarching considerations. **In contrast to the previous tools, we suggest here that reviewers consider supporting materials in addition to the teacher and student materials.**

At the end of Tool 3, reviewers are asked to summarize their responses through questions about the three overarching considerations. These questions were designed to provide guidance and stimulate discussion to determine the degree to which these issues were addressed in the curriculum materials. Recording the final outcomes from these discussions will be useful for subsequent discussions and recommendations.

Reaching a Conclusion

As mentioned earlier, these tools were designed to assist reviewers of mathematics curriculum materials in gathering information that can be used to determine the extent to which the materials provide teachers and students with the best opportunities to meet the CCSSM. The next step is to bring reviewers together and examine collectively the evidence gathered with the tools. In order to address the trajectories in the CCSSM, reviewers should collect the evidence across teams and grade bands--i.e., grades K to grade 2, grade 3 to grade 5, grade 6 to grade 8, and content areas in grades 9 to 12. Groups of reviewers are encouraged to work together to determine the strengths and weaknesses of each set of curriculum materials under review. We encourage them to identify those features that will provide teachers and students opportunities to meet the requirements of the CCSSM and prepare students for the upcoming assessments based on the CCSSM.

Tool 1
Mathematics Content
Grades K-5

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2

Name of Reviewer _____ School/District _____Date _____

Name of Curriculum Materials_____ Publication Date _____Grade Level(s) _____

Content Coverage Rubric (Cont)	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) - The mathematics content was not found.	Not Found (N) - The content was not found.
Low (L) - Major gaps in the mathematics content were found.	Low (L) - The content was not developed or developed superficially.
Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.	Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.	Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was fully formed as described in the Standards.	High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.NBT/CC Counting and Cardinality/ Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**1.NBT Number and Operations in Base Ten**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**2.NBT Number and Operations in Base Ten**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Work with numbers 11-19 to gain foundations for place value				**Understand place value**				**Understand place value.**			
1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.				2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).				1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).			
Counting and Cardinality				**Extend the counting sequence**				**Understand place value**			
1. Count to 100 by ones and tens 2. Count forward beginning from a given number within the known sequence. 3. Write number from 0 to 20. Represent a number of objects with a written numeral 0-20.				1.Count to 120, starting at any number less than 120. In this range read and write numerals and represent a number of objects with a written numeral.				2. Count within 1000; skip count by 5s, 10s,100s. 3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.			

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
K.NBT/CC Counting and Cardinality/ Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**1.NBT Number and Operations in Base Ten**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**2.NBT Number and Operations in Base Ten**	Chap. Pages	Contt N-L-M-A-H	Bal N-L-M-A-H
Work with numbers 11-19 to gain foundations for place value				**Understand place value**				**Understand place value.**			
4. Identify whether a number of objects is one group is greater than, less than, or equal to the number of objects in another group. 5. Compare two numbers between 1 and 10 presented as written numerals.				3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.				4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.			

Notes/Examples

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2

Name of Reviewer _____ **School/District** _____**Date** _____

Name of Curriculum Materials_____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) - The mathematics content was not found.	Not Found (N) - The content was not found.
Low (L) - Major gaps in the mathematics content were found.	Low (L) - The content was not developed or developed superficially.
Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.	Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.	Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was fully formed as described in the Standards.	High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**1.NBT Number and Operations in Base Ten**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**2.NBT Number and Operations in Base Ten**	Chap. Pages	Contt N-L-M-A-H	Bal N-L-M-A-H
				Use place value understanding and properties of operations to add and subtract				**Use place value understanding and properties of operations to add and subtract**			
				4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.				5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 6. Add up to four two-digit numbers using strategies based on place value and properties of operations. 7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.			

| CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2 | | | | | | | | | | |
CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2		
				Use place value understanding and properties of operations to add and subtract				Use place value understanding and properties of operations to add and subtract		
				5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.				8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.		
				6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.				9. Explain why addition and subtraction strategies work, using place value and the properties of operations.		

Notes/Examples

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2

Overall Impressions:
1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills:
6. Do the curriculum materials support the development of students' mathematical understanding?
7. Do the curriculum materials support the development of students' proficiency with procedural skills?
8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills?
9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills?
10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5

Name of Reviewer _____ School/District _____Date _____

Name of Curriculum Materials_____ Publication Date _____Grade Level(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) - The mathematics content was not found.	Not Found (N) - The content was not found.
Low (L) - Major gaps in the mathematics content were found.	Low (L) - The content was not developed or developed superficially.
Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.	Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.	Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was fully formed as described in the Standards.	High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	4.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	5.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
				Generalize place value understanding for multi-digit whole numbers.				**Understand the place value system**			
				1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.				1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.			
								2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use exponents to denote powers of 10.			

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5											
CCSS Grade 3				**CCSS Grade 4**				**CCSS Grade 5**			
3.NBT Number and Operations in Base Ten	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				Generalize place value understanding for multi-digit whole numbers.				**Understand the place value system**			
				2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.				3. Read, write, and compare decimals to 1000ths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.			
								4. Use place value understanding to round decimals to any place.			
Use place value understanding and properties of operations perform multi-digit arithmetic				**Use place value understanding and properties of operations to perform multi-digit arithmetic.**				**Perform operations with multi-digit whole numbers and with decimals to hundredths.**			
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.				4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.							
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.				5, Multiply a whole number of up to four digits by a one-digit whole Number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				5. Fluently multiply multi-digit whole numbers using the standard algorithm.			

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5											
Use place value understanding and properties of operations perform multi-digit arithmetic.	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Perform operations with multi-digit whole numbers and with decimals to hundredths.**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.			
								7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.			
Notes and Examples											

Overall Impressions: 1. What are your overall impressions of the curriculum materials examined? 2. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** 3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills:** 6. Do the curriculum materials support the development of students' mathematical understanding? 7. Do the curriculum materials support the development of students' proficiency with procedural skills? 8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials_____ **Publication Date** _____**Grade Level(s)** _____

Content Coverage Rubric (Cont):
Not Found (N) -The mathematics content was not found.
Low (L) - Major gaps in the mathematics content were found.
Marginal (M) -Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.
Acceptable (A)-Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.
High (H)-The content was fully formed as described in the standards.

Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) -The content was not found.
Low (L)-The content was not developed or developed superficially.
Marginal (M)-The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.OA Operations and Algebraic Thinking	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**1.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**2.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Understand addition as putting together and adding to, and subtraction as taking apart and taking from				**Represent and solve problems involving addition and subtraction**				**Represent and solve problems involving addition and subtraction**			
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.				1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions e.g., by using objects, drawings, and equations with a symbol for the unknown number. *Common addition and subtraction situations. Adding To or Taking From situations with result unknown, change unknown, and start unknown. Put Together/ Take Apart with total unknown, added unknown or both addends unknown.* 2. Solve word problems that call for addition of three whole numbers whose sum ≤ 20.				1.Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions*,* e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.1 Add and subtract within 20. *3*. Determine whether a group of objects (up to 20) has an odd or even number of members. Write an equation to express the total as a sum of equal addends.			

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
Understand addition as putting together and adding to, and subtraction as taking apart and taking from.	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Understand and apply properties of operations and the relationship between addition and subtraction**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**		**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
1. Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. 3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1) 4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.				3. Apply properties of operations as strategies to add and subtract.3 Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) 4. Understand subtraction as an unknown-addend problem.				4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.			
				Add and subtract within 20				**Add and subtract within 20**			
5. Fluently add and subtract within 5.				5. Relate counting to addition and subtraction. 6. Add and subtract within 20, demonstrating fluency for addition and subtraction within10. Use strategies such as counting on; making ten; decomposing a number; or using the relationship between addition and subtraction.				2. Fluently add and subtract within 20 using mental strategies. Know from memory all sums of two one-digit numbers.			
Notes/Examples:											

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Represent and solve problems involving addition and subtraction	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Represent and solve problems involving addition and subtraction	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
2. Solve addition and subtraction word problems, and add and subtract within 10.				1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions. 2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.				1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.			
				Work with addition and subtraction equations							
				7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*							
				8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.							
Notes/Examples:											

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2	
Overall Impressions: 1. What are your overall impressions of the curriculum materials examined? 2. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** 3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills** 6. Do the curriculum materials support the development of students' mathematical understanding? 7. Do the curriculum materials support the development of students' proficiency with procedural skills? 8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5

Name of Reviewer _____ **School/Dist** _____**Date** _____

Name of Curriculum Materials_____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont):	**Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):**
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Marginal (M) -Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.	Marginal (M)-The content was found and focused primarily on procedural skill and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A)-Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.	Acceptable (A)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H)-The content was fully formed as described in the standards..	High (H)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSMGrade 3				**CCSSM Grade 4**				**CCSSM Grade 5**			
3.OA Operations and Algebraic Thinking	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**4.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**5.OA Operations and Algebraic Thinking**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Represent and solve problems involving multiplication and division.				**Use the four operations with whole numbers to solve problems**				**Write and interpret numerical expressions**			
1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.				1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as equations.				1. Use parentheses, brackets, or braces in numerical expressions and evaluate expressions with these symbols.			
2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares or when 56 objects are partitioned into equal shares of 8 objects each.								2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.			
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.				2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.							

| CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5 | | | | | | | | | | | |
| CCSSM Grade 3 | | | | CCSSM Grade 4 | | | | CCSSM Grade 5 | | | |
3.OA Operations and Algebraic Thinking	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	4.OA Operations and Algebraic Thinking	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	5.OA Operations and Algebraic Thinking	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of these equations:* 8 x ? = 48, 5 = ÷ 3, 6 x 6 = ?.											
Understand properties of multiplication and the relationship between multiplication and division				**Gain familiarity with factors and multiples.**							
5. Apply properties of operations as strategies to multiply and divide. *Examples: Commutative Property of Multiplication; Associative Property of Multiplication; Distributive Property).*				4. Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.							
6. Understand division as an unknown-factor problem.											
Multiply and Divide											
7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8). Know from memory all products of 2 one-digit numbers) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit number.											

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5											
CCSSM Grade 3				**CCSSM Grade 4**				**CCSSM Grade 5**			
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Use the four operations with whole numbers to solve problems**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**		**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.				3. Solve multistep word problems posed with whole numbers and having whole number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Asses the reasonableness of answers using mental computation and estimation strategies including rounding							
Solve problems involving the four operations, and identify and explain patterns in arithmetic.				**Generate and analyze patterns**				**Analyze patterns and relationships**			
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends*				5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*				3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on the coordinate plane. *For example, given the rule "Add 3" and starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence.*			

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5
Notes/Examples:

Overall Impressions:
1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills
6. Do the curriculum materials support the development of students' mathematical understanding?
7. Do the curriculum materials support the development of students' proficiency with procedural skills?
8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills?
9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills?
10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Geometry for Grades K-2

Name of Reviewer _____ **School/District** _____**Date** _____

Name of Curriculum Materials_____ **Publication Date** _____**Grade Level(s)** _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
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High (H) - The content was fully formed as described in the Standards.	High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.G Geometry	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**1.G Geometry**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**2.G Geometry**	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).				**Reason with shapes and their attributes**				**Reason with shapes and their attributes**			
1. Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as *above*, *below, beside, in front of*, *behind*, and *next to*.				1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); -build and draw shapes to possess defining attributes.				1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.			
2. Correctly name shapes regardless of their orientations or overall size.											
3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").											

CCSSM Curriculum Analysis Tool 1—Geometry for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
Analyze, compare, create, and compose shapes	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Reason with shapes and their attributes**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Reason with shapes and their attributes**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices " corners") and other attributes (e.g., having sides of equal length).											
5. Model shapes in the world by building shapes from components (sticks and clay balls) and drawing shapes.											
6. Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*				2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.				2. Partition a rectangle into rows and columns of the same-size squares and count to find the total number of them.			
				3. Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters,* and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of or four of the shares. Understand that for these examples that decomposing into more equal shares creates smaller shares.				3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.			
Notes/Examples											

CCSSM Curriculum Analysis Tool 1—Geometry for Grades K-2	
Overall Impressions: 1. What are your overall impressions of the curriculum materials examined? 2. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** 3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills:** 6. Do the curriculum materials support the development of students' mathematical understanding? 7. Do the curriculum materials support the development of students' proficiency with procedural skills? 8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

Name of Reviewer _____ **School/District** _____ _____**Date** _____

Name of Curriculum Materials_____ **Publication Date** _____**Grade Level(s)** _____

Content Coverage Rubric:	Balance of Mathematical Understanding and Procedural Skills Rubric:
Not Found (N) - The mathematics content was not found. Low (L) - Major gaps in the mathematics content were found. Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled. Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled. High (H) - The content was fully formed as described in the Standards.	Not Found (N) - The content was not found. Low (L) - The content was not developed or developed superficially. Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills. Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed. High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NF Number and Operations— Fractions	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**
Develop understanding of fractions as numbers.				**Extend understanding of fraction equivalence and ordering**				**Apply and extend previous understandings of multiplication and division to multiply and divide fractions**			
G2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. 1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.				3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, by using a visual fraction model.				3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5											
CCSS Grade 3				**CCSS Grade 4**				**CCSS Grade 5**			
3.NF Number and Operations— Fractions	**Chap. Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**
Develop understanding of fractions as numbers				**Extend understanding of fraction equivalence and ordering**				**Apply and extend previous understandings of multiplication and division to multiply and divide fractions**			
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.				4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*				5. Interpret multiplication as scaling (resizing), Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a*/*b* = (*n*×*a*)/(*n*×*b*) to the effect of multiplying *a*/*b* by 1.			
				Extend understanding of fraction equivalence and ordering				**Use equivalent fractions as a strategy to add and subtract fractions**			
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.				1. Explain why a fraction *a*/*b* is equivalent to a fraction (*n* × *a*)/(*n* × *b*) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Recognize/generate equivalent fractions.				1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5											
CCSS Grade 3				**CCSS Grade 4**				**CCSS Grade 5**			
3.NF Number and Operations— Fractions	**Chap. Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**
Develop understanding of fractions as numbers				**Extend understanding of fraction equivalence and ordering**				**Use equivalent fractions as a strategy to add and subtract fractions**			
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.				2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions.				2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.			
				Build fractions from unit fractions y applying and extending previous understanding of operations on whole numbers				**Apply and extend previous understanding of multiplication and division to multiply and divide fractions**			
				3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole b. Decompose a fraction into a sum of fractions with the same denominator in more than one way—justify decomposition c. Add and subtract mixed numbers with like denominators. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.				3. Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5											
Grade 3				**Grade 4**				**Grade 5**			
3.NF Number and Operations— Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	4.NF Number and Operations— Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations— Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H
				Build fractions from unit fractions y applying and extending previous understanding of operations on whole numbers				**Apply and extend previous understanding of multiplication and division to multiply and divide fractions**			
				4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. b. Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.				4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.			
				5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.[4]				5. Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without multiplying b. Explaining why multiplying a given number by a fraction is greater than 1 results in a product greater than the whole number; explaining why multiplying a number by a fraction that is less than 1 results in a product smaller than the number.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5											
Grade 3				**Grade 4**				**Grade 5**			
	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H		Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	**5.NF Number and Operations—Fractions**	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H
								Apply and extend previous understanding of multiplication and division to multiply and divide fractions			
								6. Solve real world problems involving multiplication of fractions and mixed numbers.			
								7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole and compute such quotients. b. Interpret division of a whole number by a unit fraction, and compute such quotients.			

Notes and Examples:

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5											
Grade 3				**Grade 4**				**Grade 5**			
	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H		Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H
								7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.			

Notes and Examples:

Overall Impressions:
1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills
6. Do the curriculum materials support the development of students' mathematical understanding?
7. Do the curriculum materials support the development of students' proficiency with procedural skills?
8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills?
9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills?
10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding/procedural skills?

Tool 1
Mathematics Content
Grades 6-8

CCSSM Curriculum Analysis Tool 1—Ratios and Proportions for Grades 6-8

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials_____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) -The mathematics content was not found. Low (L) - Major gaps in the mathematics content were found. Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled. Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled. High (H) - The content was fully formed as described in the Standards.	Not Found (N) -The content was not found. Low (L)- The content was not developed or developed superficially. Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills. Acceptable (A)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed. High (H)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.RP Ratios and Proportional Relationships	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.RP Ratios and Proportional Relationships**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Understand ratio concepts and use ratio reasoning to solve problems.				**Analyze proportional relationships and use them to solve real-world and mathematical problems.**				**Understand connections between proportional relationships, lines, and linear equations.**			
1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak."				1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.				5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.			

CCSSM Curriculum Analysis Tool 1—Ratios and Proportional Relationships for Grades 6-8												
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**				
Understand ratio concepts and use ratio reasoning to solve problems.				**Analyze proportional relationships and use them to solve real-world and mathematical problems.**				**Understand connections between proportional relationships, lines, and linear equations.**				
2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."				2. Recognize and represent proportional relationships between quantities. 2a. Decide whether two quantities are in a proportional relationship by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 2d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation.				6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.				
3. Use ratio and rate reasoning to solve real-world and mathematical problems by reasoning. 3c. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.				2b. Identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 2c. Represent proportional relationships by equations.								
3a. Make tables of equivalent ratios relating quantities with whole umber measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.				3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.*								
3b. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.												
3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.												

CCSSM Curriculum Analysis Tool 1—Ratios and Proportional Relationships for Grades 6-8
Notes and Examples:

Overall Impressions:
1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills
6. Do the curriculum materials support the development of students' mathematical understanding?
7. Do the curriculum materials support the development of students' proficiency with procedural skills?
8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills?
9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills?
10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8

Name of Reviewer _____ School/District _____Date _____

Name of Curriculum Materials _____ Publication Date _____ Grade Level(s) _____

Content Coverage Rubric (Cont):
Not Found (N) -The mathematics content was not found.
Low (L) - Major gaps in the mathematics content were found.
Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.
Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.
High (H) - The content was fully formed as described in the Standards.

Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) -The content was not found.
Low (L) - The content was not developed or developed superficially.
Marginal (M)-The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.G Geometry	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Solve real-world and mathematical problems involving area, surface area, and volume.				**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**				**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.***			
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.				4. Know the formulas for area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.							
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply formulas $V=l\,w\,h$ and $V = bh$ to find volumes to solve real-world and mathematical problems.				6. Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.							

| CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8 | | | | | | | | | | | |
| CCSSM Grade 6 | | | | CCSSM Grade 7 | | | | CCSSM Grade 8 | | | |
6.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	7.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	8.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Solve real-world/math problems involving area, surface area, and volume.				**Solve real-world/math problems involving angle measure, area, surface area, and volume.**				**Solve real-world/ mathematical problems involving volume of cylinders, cones, and spheres.**			
4. Represent 3-dimensional figures using nets of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.				3. Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.				9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.			
				Draw, construct, and describe geometrical figures and describe the relationships between them.				**Understand congruence and similarity using physical models, transparencies, or geometry software.**			
3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate.				5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.				5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.			
								1. Verify the properties of rotations, reflections, and translations: a. lines are taken to lines and the line segments to line segments of the same length; b. angles are taken to angles; c. parallel lines are taken to parallel lines.			
								3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.			
				1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.				4. Understand that a 2-dimensional figure is similar to another if the second can be obtained from the first by rotations, reflections, translations, and dilations; given two similar figures, describe sequences that make them similar.			

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8											
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.G Geometry	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				Draw, construct, and describe geometrical figures and describe the relationships between them.				**Understand congruence and similarity using physical models, transparencies, or geometry software.**			
				2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.				2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits congruence between them.			
								Understand and apply the Pythagorean Theorem			
								6. Explain a proof of the Pythagorean Theorem and its converse.			
								7. Apply the Pythagorean Theorem to determine the unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.			
								8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.			
Notes/Examples:											

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8	
Overall Impressions: 11. What are your overall impressions of the curriculum materials examined? 12. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** 13. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 14. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 15. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills:** 16. Do the curriculum materials support the development of students' mathematical understanding? 17. Do the curriculum materials support the development of students' proficiency with procedural skills? 18. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 19. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 20. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8

Name of Reviewer _____ School/District _____Date _____

Name of Curriculum Materials_____ Publication Date _____Grade Level(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) -The mathematics content was not found. Low (L) - Major gaps in the mathematics content were found. Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled. Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled. High (H) - The content was fully formed as described in the Standards.	Not Found (N) -The content was not found. Low (L)- The content was not developed or developed superficially. Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills. Acceptable (A)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed. High (H)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**7.EE Expressions and Equations**	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**8.EE Expressions and Equations**	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Apply and extend previous understandings of arithmetic to algebraic expressions				**Use properties of operations to generate equivalent expressions**				**Work with radicals and integer exponents**			
1. Write and evaluate numerical expressions involving whole number exponents.								1. Know and apply the properties of integer exponents to generate equivalent numerical expressions.			
								4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.			

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8											
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.EE Expressions and Equations	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Apply and extend previous understandings of arithmetic to algebraic expressions				**Use properties of operations to generate equivalent expressions**				**Work with radicals and integer exponents**			
2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. b. Identify parts of an expression using mathematical terms (sum, term, product, quotient, coefficient); view one or more parts of an expression as a single entity.											
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations that include whole-number exponents, in the order when there are no parentheses to specify order.				1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.							
3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property or properties of operations.*				2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities are related.							
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).											
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or any number in a specified set.											

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8											
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.EE Expressions and Equations	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Reason about and solve one-variable equations and inequalities				**Solve real life and mathematical problems using numerical and algebraic expressions and equations**				**Analyze and solve linear equations and pairs of simultaneous linear equations**			
5. Understand solving an equation or inequality as a process of answering a question: Which values form a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.								7. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.			
7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.				4. Use variables to represent quantities in a real-world and mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **a.** Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, r are specific rational numbers. Solve equations like these fluently.							
8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of inequalities on number lines.				**b.** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.							

| CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8 | | | | | | | | | | | |
| CCSSM Grade 6 | | | | CCSSM Grade 7 | | | | CCSSM Grade 8 | | | |
6.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	7.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	8.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
								8. Analyze and solve pairs of linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. c. Solve real-world and math problems leading to two linear equations in two variables.			

Notes/Examples:

Overall Impressions:
1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills
6. Do the curriculum materials support the development of students' mathematical understanding?
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CCSSO Curriculum Analysis Tool 1—Statistics and Probability for Grades 6-8

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Grade Level(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric(Bal):
Not Found (N) -The mathematics content was not found.	Not Found (N) -The content was not found.
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High (H) - The content was fully formed as described in the Standards.	High (H)-The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.SP Statistics and Probability	Chap Pages	**Cont** N-L-M-A-H	**Bal** N-L-M-A-H	**7.SP Statistics and Probability**	Chap Pages	**Cont** N-L-M-A-H	**Bal** N-L-M-A-H	**8.SP Statistics and Probability**	Chap Pages	**Cont** N-L-M-A-H	**Bal** N-L-M-A-H
Develop understanding of statistical variability.				**Use random sampling to draw inferences about a population.**				**Investigate patterns of association in bivariate data.**			
1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*				1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Know that random sampling produces samples and supports valid inferences.				1. Construct and interpret scatterplots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.			
				2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.				2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.			

CCSSM Curriculum Analysis Tool 1—Statistics and Probability for Grades 6-8												
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**				
6.SP Statistics and Probability	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**7.SP Statistics and Probability**	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	**8.SP Statistics and Probability**	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Develop understanding of statistical variability				**Draw informal comparative inferences about two populations**							
2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.				3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable*							
3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.				4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*				4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables			
Notes/Examples												

CCSSM Curriculum Analysis Tool 1—Statistics and Probability for Grades 6-8											
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.SP Statistics and Probability	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	**7.SP Statistics and Probability**	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	**8.SP Statistics and Probability**	Chap Page	Cont N-L-M-A-H	Bal N-L-M-A-H
Summarize and describe distributions.											
4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.											
5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations; b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement; c. giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered; and d. relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.											
				Investigate chance processes and develop, use, and evaluate probability models							
				5. Understand that the probability of a chance event is a between 0 and 1 and expresses the likelihood of the event. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is not unlikely or likely, and a probability near 1 indicates a likely event.							

| CCSSM Curriculum Analysis Tool 1—Statistics and Probability for Grades 6-8 | | | | | | | | | | | |
| CCSSM Grade 6 | | | | CCSSM Grade 7 | | | | CCSSM Grade 8 | | | |
6.SP Statistics and Probability	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	7.SP Statistics and Probability	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	8.SP Statistics and Probability	Chap Page	Cont N-L-M-A-H	Bal N-L-M-A-H
				Investigate chance processes and develop, use, and evaluate probability models							
				6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.							
				7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.							
				7a. Develop a probability model by assigning equal probability to all outcomes, and use the model to find probabilities of events.							
				7b. Develop a probability model by observing frequencies in data generated from a chance process (which may not be uniform) by observing frequencies in data generated from a chance process. 7c. Design and use a stimulation to generate frequencies for compound events.							
				8. Find probabilities of compound events using lists, tables, tree diagrams, and simulation. a. Understand that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. 8c. Design and use a simulation to generate frequencies for compound events.							

CCSSM Curriculum Analysis Tool 1—Statistics and Probability for Grades 6-8

Notes/Examples

Overall Impressions:
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2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
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Balance between Mathematical Understanding and Procedural Skills
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Tool 1
Mathematics Content
Grades 9-12

CCSSM Curriculum Analysis Tool 1—Interpreting Functions in Grades 9-12

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Course(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) -The mathematics content was not found.	Not Found (N) -The content was not found.
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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
Interpreting Functions (F-IF)				
Understand the concept of a function and use function notation				
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.				
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.				
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.				
Interpret functions that arise in applications in terms of the context				
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity*				

CCSSM Curriculum Analysis Tool 1—Interpreting Functions in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*				
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.				
Analyze functions using different representations				
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.				
8. Graph linear and quadratic functions. Show intercepts, maxima, & minima.				
9. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.				
10. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.				
11. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.				
12. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.				
13. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.				
14. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.				
15. Use the properties of exponents to interpret expressions for exponential functions.				
16. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of a quadratic function and an algebraic expression for another, say which has larger maximum.*				

CCSSM Curriculum Analysis Tool 1—Interpreting Functions in Grades 9-12	
Overall Impressions: 1. What are your overall impressions of the curriculum materials examined? 2. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** 3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills** 6. Do the curriculum materials support the development of students' mathematical understanding? 7. Do the curriculum materials support the development of students' proficiency with procedural skills? 8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Reasoning with Equations and Inequalities in Grades 9-12

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Course(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
Reasoning with Equations and Inequalities (A-REI)				
Understand solving equations as a process of reasoning and explain the reasoning.				
1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.				
2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.				
Solve equations and inequalities in one variable				
3. Solve linear equations/inequalities in one variable, including coefficients represented by letters.				
4. Solve quadratic equations in one variable.				
a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula.				
b. Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate. Recognize when the quad. formula gives complex solutions.				

CCSSM Curriculum Analysis Tool 1—Reasoning with Equations and Inequalities in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
Solve systems of equations				
5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.				
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.				
8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.				
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).				
Represent and solve equations and inequalities graphically				
10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).				
11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.				
12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.				

CCSSM Curriculum Analysis Tool 1—Reasoning with Equations and Inequalities in Grades 9-12	
Overall Impressions: 1. What are your overall impressions of the curriculum materials examined? 2. What are the strengths and weaknesses of the materials you examined? **Standards Alignment:** **3.** Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation? 4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard? 5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?	**Balance between Mathematical Understanding and Procedural Skills** 6. Do the curriculum materials support the development of students' mathematical understanding? 7. Do the curriculum materials support the development of students' proficiency with procedural skills? 8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills? 9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills? 10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

CCSSM Curriculum Analysis Tool 1—Interpreting Categorical and Quantitative Data in Grades 9-12

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Course(s) _____

Content Coverage Rubric (Cont):	Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Examples
Interpreting Categorical and Quantitative Data (S-ID)				
Summarize, represent, and interpret data on a single count or measurement variable				
1. Represent data with plots on the real number line (dot plots, histograms, and box plots).				
2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.				
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).				
4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.				

Summarize, represent, and interpret data on two categorical and quantitative variables	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.				
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.				
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.				
b. Informally assess the fit of a function by plotting and analyzing residuals.				
c. Fit a linear function for a scatter plot that suggests a linear association.				
Interpret linear models				
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.				
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.				
8. Distinguish between correlation and causation.				

Overall Impressions:
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2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:
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4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
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| Overall Impressions:
11. What are your overall impressions of the curriculum materials examined?
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CCSSM Curriculum Analysis Tool 1—Similarity, Right Triangles, and Trigonometry & Trigonometric Functions in Grades 9-12

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Course(s) _____

Content Coverage Rubric (Cont):
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Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
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Marginal (M)-The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
Similarity, Right Triangles, and Trigonometry (G-SRT)				
Understand similarity in terms of similarity transformations				
1. Verify experimentally the properties of dilations given by a center and a scale factor:				
a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.				
b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.				
2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.				
3. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.				
4. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.				
5. Prove theorems about similar triangles.				

CCSS Curriculum Analysis Tool 1—Similarity, Right Triangles, and Trigonometry & Trigonometric Functions in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
Define trigonometric ratios and solve problems involving right triangles				
1. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.				
2. Explain and use the relationship between the sine and cosine of complementary angles.				
3. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. ★				
Apply trigonometry to general triangles				
1. (+) Derive the formula $A = 1/2\ ab\ \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.				
2. (+) Prove the Laws of Sines and Cosines and use them to solve problems.				
3. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).				
Trigonometric Functions (F-TF)				
Extend the domain of trigonometric functions using the unit circle				
1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.				
2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.				
3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for π–x, π+x, and 2π–x in terms of their values for x, where x is any real number.				
4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.				
Model periodic phenomena with trigonometric functions				
5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.				
6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.				

CCSS Curriculum Analysis Tool 1—Similarity, Right Triangles, and Trigonometry & Trigonometric Functions in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. ★				
Prove and apply trigonometric identities				
8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.				
9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.				

Overall Impressions:

1. What are your overall impressions of the curriculum materials examined?
2. What are the strengths and weaknesses of the materials you examined?

Standards Alignment:

3. Have you identified gaps within this domain? What are they? If so, can these gaps be realistically addressed through supplementation?
4. Within grade levels, do the curriculum materials provide sufficient experiences to support student learning within this standard?
5. Within this domain, is the treatment of the content across grade levels consistent with the progression within the Standards?

Balance between Mathematical Understanding and Procedural Skills

6. Do the curriculum materials support the development of students' mathematical understanding?
7. Do the curriculum materials support the development of students' proficiency with procedural skills?
8. Do the curriculum materials assist students in building connections between mathematical understanding and procedural skills?
9. To what extent do the curriculum materials provide a balanced focus on mathematical understanding and procedural skills?
10. Do student activities build on each other within and across grades in a logical way that supports mathematical understanding and procedural skills?

Tool 2
Mathematical Practices

CCSSM Mathematical Practices Analysis Tool 2	Page 1

Name of Reviewer _____ School/District _____Date _____

Name of Curriculum Materials _____ Publication Date _____Grade Level(s) _____

Tool 1 Domain Considered _____

Opportunities to Engage in the Standards for Mathematical Practices **Found Across the Content Standards**		
Overarching Habits of Mind	**1. Make sense of problems and persevere in solving them.**	**6. Attend to precision.**
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		
Reasoning and Explaining	**2. Reason abstractly and quantitatively.**	**3. Construct viable arguments and critique the reasoning of others.**
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		

CCSSM Mathematical Practices Analysis Tool 2		Page 2
Modeling and Using Tools	**4. Model with mathematics.**	**5. Use appropriate tools strategically.**
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		
Seeing Structure and Generalizing	**7. Look for and make use of structure.**	**8. Look for and express regularity in repeated reasoning.**
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		

Synthesis of Standards for Mathematical Practice	Page 3
(Mathematical Practices → Content) To what extent do the materials demand that students engage in the Standards for Mathematical Practice as the primary vehicle for learning the Content Standards?	
(Content → Mathematical Practices) To what extent do the materials provide opportunities for students to develop the Standards for Mathematical Practice as "habits of mind" (ways of thinking about mathematics that are rich, challenging, and useful) throughout the development of the Content Standards?	
To what extent do accompanying assessments of student learning (such as homework, observation checklists, portfolio recommendations, extended tasks, tests, and quizzes) provide evidence regarding students' proficiency with respect to the Standards for Mathematical Practice?	
What is the quality of the instructional support for students' development of the Standards for Mathematical Practice as habits of mind?	

Summative Assessment	Explanation for score
(Low) – The Standards for Mathematical Practice are not addressed or are addressed superficially. (Marginal) The Standards for Mathematical Practice are addressed, but not consistently in a way that is embedded in the development of the Content Standards. (Acceptable) – Attention to the Standards for Mathematical Practice is embedded throughout the curriculum materials in ways that may help students to develop them as habits of mind.	

COMMON CORE STATE STANDARDS FOR MATHEMATICS

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning , strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately) and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1   Make sense of problems and persevere in solving them.
Mathematically proficient students:
- explain to themselves the meaning of a problem and looking for entry points to its solution.
- analyze givens, constraints, relationships, and goals.
- make conjectures about the form and meaning of the solution attempt.
- plan a solution pathway rather than simply jumping into a solution.
- consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution.
- monitor and evaluate their progress and change course if necessary.
- transform algebraic expressions or change the viewing window on their graphing calculator to get information.
- explain correspondences between equations, verbal descriptions, tables, and graphs.
- draw diagrams of important features and relationships, graph data, and search for regularity or trends.
- use concrete objects or pictures to help conceptualize and solve a problem.
- check their answers to problems using a different method.
- ask themselves, "Does this make sense?"
- understand the approaches of others to solving complex problems and identify correspondences between approaches.

2. Reason abstractly and quantitatively.
Mathematically proficient students:
- make sense of quantities and their relationships in problem situations.
- Bring two complementary abilities to bear on problems involving quantitative relationships:
  - ✓ *decontextualize* (abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents and
  - ✓ *contextualize* (pause as needed during the manipulation process in order to probe into the referents for the symbols involved).
- use quantitative reasoning that entails creating a coherent representation of the problem at hand, considering the units involved, and attending to the meaning of quantities, not just how to compute them
- know and flexibly use different properties of operations and objects.

3   Construct viable arguments and critique the reasoning of others.
Mathematically proficient students:
- understand and use stated assumptions, definitions, and previously established results in constructing arguments.
- make conjectures and build a logical progression of statements to explore the truth of their conjectures.
- analyze situations by breaking them into cases
- recognize and use counterexamples.
- justify their conclusions, communicate them to others, and respond to the arguments of others.

- reason inductively about data, making plausible arguments that take into account the context from which the data arose
- compare the effectiveness of plausible arguments
- distinguish correct logic or reasoning from that which is flawed and, if there is a flaw, explain what it is
  - ✓ elementary students construct arguments using concrete referents such as objects, drawings, diagrams, and actions..
  - ✓ later students learn to determine domains to which an argument applies.
- listen or read the arguments of others, decide whether they make sense, and ask useful question to clarify or improve arguments

4 Model with mathematics.
Mathematically proficient students:
- apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.
  - ✓ In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community.
  - ✓ By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another.
- make assumptions and approximations to simplify a complicated situation, realizing that these may need revision later.
- identify important quantities in a practical situation
- map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas.
- analyze those relationships mathematically to draw conclusions.
- interpret their mathematical results in the context of the situation.
- reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5 Use appropriate tools strategically.
Mathematically proficient students
- consider available tools when solving a mathematical problem. (These tools might include pencil and paper, concrete models, a ruler, protractor, calculator, spreadsheet, computer algebra system, a statistical package, or dynamic geometry software.
- are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations.
  - ✓ High school students analyze graphs of functions and solutions generated using a graphing calculator
- detect possible errors by using estimations and other mathematical knowledge.
- know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data.
- identify relevant mathematical resources and use them to pose or solve problems.
- use technological tools to explore and deepen their understanding of concepts.

6 Attend to precision.
Mathematically proficient students:
- try to communicate precisely to others.
- try to use clear definitions in discussion with others and in their own reasoning.
- state the meaning of the symbols they choose, including using the equal sign consistently and appropriately.
- specify units of measure and label axes to clarify the correspondence with quantities in a problem.
- calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context.
  - ✓ In the elementary grades, students give carefully formulated explanations to each other.
  - ✓ In high school, students have learned to examine claims and make explicit use of definitions.

7 Look for and make use of structure.
Mathematically proficient students:
- look closely to discern a pattern or structure.
  - ✓ Young students might notice that three and seven more is the same amount as seven and three more or they may sort a collection of shapes according to how many sides the shapes have.

- ✓ Later, students will see 7 x 8 equals the well remembered 7 x 5 + 7 x 3, in preparation for the distributive property.
  - ✓ In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 x 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems.
- step back for an overview and can shift perspective.
- see complicated things, such as some algebraic expressions, as single objects or composed of several objects.

8 Look for and express regularity in repeated reasoning.

Mathematically proficient students:

- notice if calculations are repeated
- look both for general methods and for shortcuts.
  - ✓ Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeated decimal.
  - ✓ Middle school students might abstract the equation (y-2)/((x-1)=3 by paying attention to the calculation of slope as they repeatedly check whether the points are on the line through (1,2) with a slope 3.
  - ✓ Noticing the regularity in the way terms cancel when expanding $(x-1)(x+1)(x^2+1)$ and $(x-1)(x^3+x^2+x+1)$ might lead high school students to the general formula for the sum of a geometric series.
- maintain oversight of the process of solving a problem, while attending to the details.
- continually evaluate the reasonableness of intermediate results.

Tool 3
Overarching Considerations

Equity
Formative Assessment
Technology

CCSSM Curriculum Analysis Tool 3 (Overarching Considerations)

This tool should be used after reviewing mathematics curriculum materials using Tool 1 (Content Analysis) and Tool 2 (Mathematical Practices Analysis). After reviewing the curriculum materials carefully, answer the questions below reflecting important overarching considerations with regard to the materials. Overarching considerations are those that support the teaching of Mathematics Core Content and Practices. **Equity:** NCTM (1991) calls for teachers to build on how students' linguistic, ethnic, racial, gender, and socioeconomic backgrounds influence their learning; to help students to become aware of the role of mathematics in society and culture; to expose students to the contributions of various cultures to the advancement of mathematics; and to show students how mathematics relates to other subjects; and to provide students with opportunities to apply mathematics to authentic contexts. CCSSM also notes that, "The Standards should be read as allowing for the widest possible range of students to participate fully from the outset, along with appropriate accommodations to ensure maximum participation of students with special education needs." **Formative Assessment** is a critical part of classroom instruction, and curriculum materials can provide a variety of levels of support with regard to information to teachers about student learning. Finally, the increasing availability of **technology** offers opportunities to use technology mindfully in ways that enable students to explore and deepen their understanding of mathematical concepts.

Name of Reviewer _____School/District _____Date _____

Name of Curriculum Materials _____ Publication Date _____Grade Level(s) _____

Rubric for answering questions about Overarching Considerations:
   Not Found (N) - The curriculum materials do not support this element.
   Low (L) - The curriculum materials contain limited support for this element, but the support is not embedded or consistently present within or across grades.
   Medium (M) - The curriculum materials contain support for this element, but it is not always embedded or consistently present within or across grades.
   High (H) - The curriculum materials contain embedded support for this element so that it is consistently present within and across grades.

Questions about Overarching Considerations (Page 1)	See Rubric	Comments/Examples
Equity	N-L-M-H	
To what extent do the materials:		
1. Provide teachers with strategies for meeting the needs of a range of learners?		
2. Provide instructional support to help teachers sequence or scaffold lessons so that students move from what they know to what they do not know?		
3. Provide opportunities for teachers to use a variety of grouping strategies?		
4. Embed tasks with multiple entry-points that can be solved using a variety of solution strategies or representations?		
5. Suggest accommodations and modifications for English language learners that will support their regular and active participation in learning mathematics?		

Questions about Overarching Considerations (Page 2)	See Rubric	Comments/Examples
To what extent do the materials:	**N-L-M-H**	
6. Provide opportunities to use reading, writing, and speaking in mathematics lessons.		
7. Encourage teachers to draw upon home language and culture to facilitate learning?		
8. Encourage teachers to draw on multiple resources such as objects, drawings, and graphs to facilitate learning?		
9. Draw upon students' personal experiences to facilitate learning?		
10. Provide opportunities for teacher and students to connect mathematics to other subject areas?		
11. Provide both individual and collective opportunities for students to learn using mathematical tasks with a range of challenge?		
12. Provide opportunities for advanced students to investigate mathematics content at greater depth?		
13. Provide a balanced portrayal of various demographic and personal characteristics?		
Assessment		
14. Provide strategies for gathering information about students' prior knowledge and background?		
15. Provide strategies for teachers to identify common student errors and misconceptions?		
16. Assess students at a variety of knowledge levels (e.g., memorization, understanding, reasoning, problem solving)?		
17. Encourage students to monitor their own progress?		
18. Provide opportunities for ongoing review and practice with feedback related to learning concepts, and skills.		
19. Provide support for a varied system of on-going formative and summative assessment (formal or informal observations, interviews, surveys, performance assessments, target problems)?		

CCSSM Instructional Materials Analysis Project--Overarching Considerations (Tool 3)		Page 3
Questions about Overarching Considerations (Page 2)	**See Rubric**	**Comments/Examples**
Technology	**N-L-M-H**	
To what extent do the materials:		
20. Integrate technology such as interactive tools, virtual manipulatives/objects, and dynamic mathematics software in ways that engage students in the Mathematical Practices?		
21. Include or reference technology that provides opportunities for teachers and/or students to communicate with each other (e.g. websites, discussion groups, webinars)?		
22. Include opportunities to assess student mathematical understandings and knowledge of procedural skills using technology?		
23. Include or reference technology that provides teachers additional tasks for students?		
24. Include teacher guidance for the mindful use of embedded technology to support and enhance student learning?		

Notes/Examples:

Summary Discussion Questions

1. Equity: To what extent do the materials contain embedded support for elements of equity consistently within and across grades?
2. Assessment: To what extent do the materials contain embedded support for elements of assessment consistently within and across grades?
3. Technology: To what extent do the materials contain embedded support for elements of technology consistently within and across grades?
4. Overall: To what extent do the materials incorporate the Overarching Consideration elements to advance students' learning of mathematical content and engagement in the mathematical practices?

Professional Development

Facilitator Guide

CCSS Mathematics Curriculum Analysis Project

June 1, 2011

Professional Development for Mathematics Teachers and Administrators
CCSS Mathematics Curriculum Analysis Project

Goals of the Professional Development Sessions:

- To provide an overview of the CCSSM curriculum analysis tools for reviewers
- To acquaint participants with the processes and tools to be used in their reviews of curriculum materials
- To assist participants in using appropriate criteria in the selection of mathematics curriculum materials

Focus of the Professional Development Session:

To ensure that participants are familiar with the three tools to be used in analyzing mathematics curriculum materials:
- Tool 1—Mathematics Content Alignment
- Tool 2—Use of Mathematical Practices
- Tool 3—Overarching Issues

Professional Development Schedule of Activities

Session 1 (2 hours)
Activity 1-Introductions and Overview of Project
Activity 2-Common Core State Standards in Mathematics

Session 2 (1 hour)
Activity 3-Overview of Standards of Mathematics Practice

Session 3 (1 hour)
Activity 4: Using Tool 1

Session 4: (1 hour)
Activity 5: Using Tool 2

Session 5: (1.5 hours)
Activity 6: Using Tool 3

A set of PowerPoint slides were developed to support these professional development sessions. Contact the Council of Chief State School Officers if they were not included with this set of materials.

Professional Development for Mathematics Teachers and Administrators
CCSS Mathematics Curriculum Analysis Project

Session 1: Project Overview and CCSSM Content Standards   *Time:* **2 hours**

Goals: 1. Participants will learn about the funders of and development team members involved with the CCSS Mathematics Curriculum Analysis Project
2. Participants will learn about the process used to develop the products (Tools 1, 2, and 3, User's Guide, professional development sessions) of the CCCSS Mathematics Curriculum Analysis Project.
3. Participants will learn the roles and purposes of each of the three analysis tools developed in the Project.

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Activity 1: Introductions and Overview of Program Developers and Products

Leader(s): _____

Activity Objective: Ensure that participants are aware of how the curriculum analysis tools were developed.

Approximate Time Length: 1 hour

Materials Needed: PowerPoint slides of program development; copies of Tools 1, 2, and 3

Instructions for Facilitator:
1. Ask participants to introduce themselves by providing name, nature and location of their work
2. Share the overall goals, focus, and schedule of the professional development sessions
3. Share funders, development team members, and development process
4. Describe the process used to develop the tools (PowerPoint slide).
5. Describe the goals of Session 1

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Activity 2: Overview of the Content Standards of the Common Core State Standards in Mathematics

Leader(s): _____

Activity Objective: Ensure that participants become aware of the content, organization, and structure of the content standards of the *Common Core State Standards in Mathematics (CCSSM)*

Approximate Time Length: 1 hour

Materials Needed: One copy of the *Common Core State Standards in Mathematics* for every two or three participants, PowerPoint slides of the activities; poster paper, markers

Activity Objective: Ensure that participants understand and become familiar with the content and structure of the *Common Core State Standards in Mathematics*

Instructions for Facilitator:

1. Place participants in groups of 2-4 persons by gradespan—K-2, 3-5, 6-8, 9-12.
2. Ask the groups to note the structure of the content domain, clusters, and standards. Have them discuss what each category represents.
3. For K-5 and 6-8 groups, ask the group members to identify "trajectories" of content topics that span across grade levels. (Leaders might assign groups specific domains or clusters to examine.) For high school groups, as them to identify "trajectories" within content areas.
4. Ask groups to record their strands on chart paper.
5. Have groups (1) report their findings and (2) identify any challenges that they had with the tasks.
6. Close by noting and summarizing the "trajectories" that were found by the groups.

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Session 2:   ***Time:* 1 hour**

Activity 3: Overview of the Standards of Mathematical Practice in the Common Core State Standards for Mathematics

Leader(s): _____

Activity Objective: Ensure that teachers and administrators become aware of the content, organization, and structure of the Mathematical Practices in the *Common Core State Standards for Mathematics (CCSSM)*

Approximate Time Length: 1 hour

Materials Needed: One copy of the *Common Core State Standards for Mathematics* for every two or three participants, bulleted Mathematical Practices (see pages 77-78 of this document), PowerPoint slides of the Standards; poster paper, markers

Activity Objective: Ensure that participants understand and become familiar with the content and structure of the Mathematical Practices in the *Common Core State Standards for Mathematics*

Instructions for Facilitator:

1. Place participants into groups of 2-4 persons (try to ensure each group includes one person with an elementary, middle school, or high school background).
2. Assign each group 1-3 Mathematical Practices on which to focus the group work depending on how many groups are formed. If possible, assign a Practice to more than one group. (There are 8 Mathematics Practices.)
3. For each assigned Mathematical Practice, ask the groups to construct student mathematics tasks that reflect the Practice. A student task may address more than one Mathematical Practice.
4. Ask groups to record their tasks on chart paper.
5. Have groups discuss the tasks and provide a justification for addressing the Mathematical Practice. Ask them to discuss any challenges with the task.
6. Close by summarizing good strategies to create appropriate tasks and to help colleagues construct similar tasks.

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Session 3:   *Time:* **1hour**

Activity 4: Using Tool 1(Mathematics Content)

Activity Objective: Participants will learn how to use Tool 1

Approximate Time Length: 1 hour

Materials Needed: Participants should have enough copies of Tool 1 so that they have all the tools that address the grade span most comfortable to them. For example, K-2 participants should review tools focusing on K-2 topics. The same assignment of tools should be made for 3-5, 6-9, and 9-12 participants respectively. Mathematics textbooks or curriculum materials that span grades K-2 or 3-5 should be provided the elementary-based participants. Curriculum materials or textbooks in grades 6-8 should be provided to the middle school participants. A set of high school Algebra I, Geometry, and Algebra II textbooks, and/or an integrated high school mathematics series covering the first three years of high school should be provided to the high school participants. All participants should receive a copy of the User's Guide.

Instructions for Facilitator:

1. Discuss the components of Tool 1
2. Place participants in grade span groups (K-2, 3-5, 6-8, and 9-12). Have them read the User's Guide with regard to using Tool 1.
3. Provide each a set of curriculum materials or textbooks appropriate to their strand. Give each group at least two versions of Tool 1 focused on different mathematics content topics. Have each group review their respective curriculum materials and complete Tool 1 for each content topic.
4. After each group has completed an analysis of their materials using the respective tools, ask them to discuss the extent to which the curriculum materials or textbook aligns with the mathematics content in their Tool 1. Ask them to discuss the strengths and weaknesses of their curriculum materials or textbooks with regard to alignment.
5. Finally, as a group, have them discuss any challenges or problems that they had in using Tool 1. Discuss strategies for overcoming those challenges.

===

Session 4:   *Time:* **1 hour**

Activity 5: Using Tool 2(Mathematical Practices)

Activity Objective: Participants will learn how to use Tool 2 focusing on Mathematical Practices.

Approximate Time Length: 60 minutes

Materials Needed: Each participant should have a copy of Tool 2, the bulleted list of Mathematical Practices, and the User's Guide. Elementary school reviewers should have mathematics textbooks or curriculum materials that span grades K-2 or 3-5. Middle school reviewers should have mathematics textbooks and curriculum materials that span grades 6-8. A set of high school Algebra I, Geometry, and Algebra II textbooks, and/or an integrated high school mathematics series covering the first three years of high school should be provided to the high school participants.

Instructions for Facilitator:

1. Place participants in grade span groups (K-2, 3-5, 6-8, and 9-12). Have them read the User's Guide with regard to using Tool 2.
2. Ask groups to use the same curriculum materials that they used in the analysis with Tool 1. Ask groups to select one or more of the "shaded" strands in Tool 1 for their analysis.
3. Ask groups to use Tool 2 to analyz3e the extent to which the curriculum materials or textbook focus on the Mathematical Practices in student activities or tasks or through recommendations to teachers.
4. After each group has completed an analysis of their materials using the respective tools, ask them to discuss the extent to which the curriculum materials or textbooks embed the Mathematical Practices in their lessons. Ask them to discuss the strengths and weaknesses of their curriculum materials or textbooks with regard to addressing the Mathematical Practices.
5. Finally, as a group, ask them to discuss any challenges or problems that they had in using Tool 2. Discuss strategies for overcoming those challenges.

===

Session 5: *Using Tool 3(Overarching Considerations)*   *Time:* **45 minutes**

Activity Objective: Participants will learn how to use Tool 3 focusing on the overarching issues of equity, assessment, and technology.

Approximate Time Length: 45 minutes

Materials Needed: Each participant should have a copy of Tool 3 and the User's Guide. Elementary school reviewers should have mathematics textbooks and/or curriculum materials that span grades K-2 or 3-5. Middle school participants should have mathematics textbooks and curriculum materials that span grades 6-8. A set of high school Algebra I, Geometry, and Algebra II textbooks, and/or an integrated high school mathematics series covering the first three years of high school should be provided to the high school participants.

Instructions for Facilitator:

1. Place participants in grade span groups (K-2, 3-5, 6-8, and 9-12). Ask them to read the User's Guide with regard to using Tool 3.
2. Ask groups to use the same curriculum materials that they used in the analysis with Tool 1.
3. Ask groups to use Tool 3 to analyze the extent to which the curriculum materials or textbook provide teachers support in the areas of equity, assessment, and technology.
4. After each group has completed the analysis, ask them to discuss the extent to which the curriculum materials or textbooks support considerations of equity, assessment, and technology. Ask them to discuss the strengths and weaknesses of their curriculum materials or textbooks with regard addressing these considerations.
5. Finally, as a group, ask them to discuss the strengths of the tools and any challenges or problems that they had in using the tools. Discuss strategies for overcoming those challenges.

Session 6: *Reaching Consensus as a Team*   **Time:** *45 minutes*

Activity Objective: Participants will use the information gathered from the Tools to inform decisions about the
        curriculum materials.

Approximate Time Length: 45 minutes

Materials Needed: Tools 1, 2, and 3 completed by participants; summary charts; chart paper and marker.

Instructions for Facilitators:

1. Ask participants to gather the completed versions of the three tools. Have them write brief
    summaries of the strengths and weaknesses of each set of curriculum materials with regard to their
    analyses using Tools 1, 2, and 3. Ask them to complete the chart for each tool, completing Tool1
    first, Tool 2 next, and Tool 3 last.
2. Create three sets of chart paper for each tool that includes textbooks reviewed down the left-hand
    side and three columns on the right that indicates STRENGTHS, NEUTRAL, and WEAKNESSES.
    Ask the reviewers to insert their comments in the appropriate columns of the chart paper. Once all
    comments have been written on the charts, ask participants to discuss strengths and weaknesses of
    each set of curriculum materials reviewed.
3. Close with a discussion about the strengths and weaknesses of using these tools to analyze
    curriculum materials.

Facilitator Guide PowerPoint Slides

Slide 1

Professional Development for
CCSSM Curriculum Analysis
Reviewers

June 2011

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Slide 2

Introductions

Ask participants to introduce themselves
and indicate their current work and why
they are serving on this committee.

_____

_____

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_____

Slide 3

Goals of Professional
Development Sessions

• To provide an overview of the CCSSM
Curriculum Analysis Tools for reviewers
• To acquaint reviewers to the process and tools
to be used in their reviews of curriculum
materials
• To assist reviewers in using appropriate
criteria in the selection of mathematics
curriculum materials

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Slide 4

Focus of Professional Development

To ensure that reviewers are familiar with the three tools to be used in analyzing mathematics curriculum materials:

- Tool 1—Mathematics Content Alignment
- Tool 2—Use of Mathematical Practices
- Tool 3—General Overarching Considerations

Slide 5

Professional Development Schedule

1st/2nd Hr	Overview of Curriculum Analysis Project
	Introduction of Common Core Standards (Domains, Clusters, Standards)
	Introduction of Three Analysis Tools
	Description of Development Process
3rd Hr	Description and Use of Tool 1
4th Hr	Description and Use of Tool 2
5th Hr	Description and Use of Tool 3
6th Hour	Reaching Consensus as a Team

Slide 6

Financial Support for the Curriculum Analysis Tools

- Brookhill Foundation (Kathy Stumpf)
- Texas Instrument (through CCSSO)

Slide 7

Development Team

- William S. Bush (chair), Mathematics Educator, University of Louisville, Kentucky
- Diane Briars, President, National Council of Supervisors of Mathematics, PA
- Jere Confrey, Mathematics Educator, North Carolina State University
- Kathleen Cramer, Mathematics Educator, University of Minnesota
- Carl Lee, Mathematician, University of Kentucky
- W. Gary Martin, Mathematics Educator, Auburn University, Alabama
- Michael Mays, Mathematician, West Virginia University
- Valerie Mills, Supervisor, Mathematics Education, Oakland Schools, Michigan
- Fabio Milner, Mathematician, Arizona State University
- Suzanne Mitchell, Mathematics Educator/Administrator, Executive Director of the Arkansas Science, Technology, Engineering and Mathematics (STEM) Coalition
- Thomas Post, Mathematics Educator, University of Minnesota
- Robert Ronau, Mathematics Educator, University of Louisville, Kentucky
- Donna Simpson Leak, Superintendent, Rich Township High School District 227, IL
- Marilyn Strutchens, Mathematics Educator, Auburn University, Alabama

Slide 8

Tool Development Process

- Development Team formed in October 2010
- First version of tools developed in November 2010
- Initial drafts of tools piloted with groups of elementary middle, and high school teachers in December 2010
- Tools revised based on these pilots
- Tools reviewed by postsecondary mathematics educators, mathematicians, and public school administrators nationally in January 2011
- Tools revised based on input from these reviewers to obtain final versions in April 2011

Slide 9

Session 1 Goals

1. Teachers and administrators will know the funders of and development team members in the CCSSO Mathematics Curriculum Analysis Project
2. Teachers and administrators will learn about the process in developing the products (Tools 1, 2, and 3, User's Guide, professional development sessions) of the CCSSO Mathematics Curriculum Analysis Project.
3. Teachers will learn the roles and purposes of each of the three analysis tools developed in the Project.

Slide 10

Overview of Common Core Content Standards in Mathematics

- Group into grade bands of 2-4 persons: K-2, 3-5, 6-8, and 9-12
- Provide each group a copy of the CCSSM in Mathematics
- Note the structure of the CCSSM
- Look for "trajectories" of like content topics across grade bands (e.g., addition/subtraction, fractions, solving equations, quadrilaterals)
- Record strands on chart paper
- Discuss the "trajectories."

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Slide 11

CCSS Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

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Slide 12

Overview of Standards of Mathematical Practices

- Keep reviewers in the same groups as the previous activity
- Assign each group 1-3 Mathematical Practices to review
- Ask groups to construct mathematical tasks that reflects their assigned Practices
- Write tasks on chart paper
- Discuss challenges with regard to developing tasks

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Purpose of Tool 1

- Determine the extent to which the Core Content Standards in Mathematics are included in the mathematics curriculum materials
- Determine the extent to which Core Content Standards in Mathematics are sequenced appropriately in the mathematics curriculum materials

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Slide 14

Tool 1 Activity (Mathematical Content)

- Distribute the grade-level versions of Tool 1 focusing on Mathematical Content Standards to participants
- Explain/Discuss the components of Tool 1
- Divide participants into groups and have them analyze curriculum materials with their assigned tool
- Discuss alignment between curriculum materials and Mathematics Content Standards
- Discuss challenges with using Tool 1

Slide 15

Components of Tool 1

Review the following components of Tool 1
- Information about reviewers
- Grade/Course location of content in textbooks
- Judgment about alignment with standard (1, 2, 3)
- Notes and comments about alignment and quality
- General comments about mathematical content and practices

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Tool 1
K-5 Mathematics Content

- Two-Dimensional Geometry for Grades K-2
- Two-Dimensional Geometry for Grades 3-5
- Place Value and Base 10 Concepts for Grades K-2
- Place Value Concepts for Grades 3-5
- Addition and Subtraction for Grades K-2
- Multiplication and Division for Grades K-5

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Tool 1
6-8 Mathematics Content

- Ratios and Proportional Relations
- Expressions and Equations
- Geometry
- Statistics and Probability

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Tool 1
9-12 Mathematics Content

- Reasoning with Equations
- Interpreting Functions
- Similarity and Trigonometry
- Interpreting Categorical and Quantitative Data

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Use/Review of Tool 1

- Divide group in pairs or triples
- Distribute different tools and textbooks to each group
- Ask groups to analyze textbooks using their assigned tool
- Ask each group to complete chart in Review of Content Analysis Tool
- Discuss their responses as a group and record responses to questions

Slide 20

Purpose of Tool 2 (Mathematical Practices

To determine the extent to which the mathematics curriculum materials reflect and involve students in the Mathematical Practices

Slide 21

Introduction of Tool 2 (Mathematical Practices)

- Distribute Tool 2 to groups as formed in previous Tool 1 activity
- Distribute the bulleted list of Mathematical Practices
- Ask groups to go to page 7 in the User's Guide and read about using Tool 2
- Discuss the organization of the Practices in the section (next slide)

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Components of Tool 2

- Information about reviewers
- Extent to which materials address Mathematical Practices
- Judgment about integration of Practices among themselves
- Judgment about embeddedness of Practices in the materials evaluated
- Rationale and Examples about each of last 3 bullets

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Use/Review of Tool 2

- Ask groups to select one or more shaded areas from Tool 1 and describe how the Mathematical Practices were treated in the curriculum materials using Tool 2
- Ask each group to complete chart in Review of Mathematical Practices Tool
- Discuss challenges in using Tool 2

Slide 24

Presentation and Review of Tool 3

- Distribute Tool 3 (Overarching Considerations Regarding Mathematics Curriculum Analysis) and discuss the sections and questions in the tool.
- Ask reviewers to work in same groups as for Tools 1 and 2 and complete Tool 3 with regard to their previous textbooks.
- Ask each group to complete chart in Review of Tool 3.
- Discuss and compare responses on the tables in Tool 3. Discuss differences and consensus.

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Closing Activity

What the strengths of the tools?

What are the greatest challenges or issues regarding using the three tools?